

**REMARKS**

Claims 13-17 are all the claims pending in the application.

Claim 17 has been added. Support for claim 17 can be found in original claim 2.

Claim 13 has been rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Liu et al., U.S. Publication No. 2004/0081764 A1 ("Liu").

Claims 14-16 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Liu et al., U.S. Publication No. 2004/0081764 ("Liu").

Liu discloses Rhodorsil 2074, Darocur 1173 and Irgacure 184 as the photopolymerization initiator. Applicants submit that these photopolymerization initiators are not oligomer type photopolymerization initiators as in Applicants' claimed invention. Rhodorsil 2074 is tetrakis(pentafluorophenyl)borate de 4-methylphenyl[4-(methyl)phenyl], Darocur 1173 is 2-hydroxy-2-methyl-1-phenyl-propan-1-one and Irgacure 184 is 1-hydroxy-cyclohexyl-phenyl-ketone, as shown in the catalog copies attached herewith. Therefore, Applicants submit that Liu does not disclose Applicants' claimed oligomer type polymerization initiator.

Additionally, Applicants submit that Irgacure 184 is used as the photopolymerization initiator in Comparative Examples 1 and 2 in the present specification. In Comparative Examples 1 and 2 the adhesion property between the hard coat layer and the substrate after heat at 150°C for 1 hour and gas generation in heat treatment of the obtained hard coat layer are described in Table 1. The Comparative Examples illustrate that the photopolymerization

initiators in Liu cause the generation of gas as well as a reduction in the adhesion property between the hard coat layer and the substrate after heating at 150°C for 1 hour.

On the contrary, the present invention uses an oligomer type polymerization initiator. In Examples 1 and 2 of the present invention, poly[2-hydroxy-2-methyl-1{4-(1-methylvinyl)phenyl}propanone] (produced by LANBELTY CORPORATION, ESCURE KIP150) is used as the oligomer type photopolymerization initiator. In Table 1, the hard coat layer of Examples 1 and 2 exhibits an unexpectedly superior adhesion property between the hard coat layer and the substrate after heating at 150°C for 1 hour and there is no gas generation. Therefore, Applicants respectfully submit that the presently claimed invention provides unexpectedly superior results as compared with the Liu.

Applicants submit that the presently claimed invention is not anticipated or obvious over Liu. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejections.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Appln. No.: 10/086,243  
Amendment under 37 C.F.R. § 1.111

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

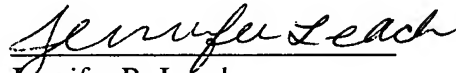
Respectfully submitted,

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WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

  
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Date: December 29, 2004

## Georgia Tech Microelectronics Research Center SEARCH




## Cleanroom Information

## &gt;&gt;&gt;Chemical Index and MSDS Database

Scheduler User Services Floorplan Equipment Training Safety Information See the Cleanroom Contact Staff

## Category: R

Name	Ingredients	CAS	Supplier
<u>R/Flex 3000 Series LCP Films</u>	2-naphthalenecarboxylic acid; 6-(acetyloxy)-polymer; with 4-(acetyloxy) benzoic acid [70679-92-4]		Rogers Corporation
<u>RD6 Resist Developer</u>	water [7732-18-5]; tetramethyl ammonium hydroxide [75-59-2]; additive		Futurrex
<u>RenShape SL 5510</u>	alkyl carbonate; alcohol ether; cycloaliphatic epoxy resin; aliphatic glycidyl ether; diacrylate esters; acrylate esters; antimony compound; photoinitiator; soluble oligomer; epoxides;	confidential concentrates	Ventico INC
 <u>Rhodorsil Photoinitiator 2074</u>	tetrakis(pentafluorophenyl) borate de 4-methylphenyl [4-(1-methyl)phenyl] iodonium	178233-72-2	Rhodia
<u>Riston FX515 Photopolymer Film</u>	Acetone [67-64-1]; 2,2 Azobis 2-Methyl-Propanenitrile [78-67-1]; Methanol [67-56-1]; Aliphatic Alcohol;		DuPont
<u>RR2 Resist Remover</u>	dimethyl sulfoxide[67-68-58]; water[7732-18-8]; proprietary additive		Futurrex
<u>RR3 resist remover</u>	Water [7732-18-5]; Tetramethyl Ammonium Hydroxide [75-59-2]; Additive		Futurrex
<u>RR4 Resist Remover</u>	Dimethyl Sulfoxide [67-68-58]	67-68-58	Futurrex

Return to the Chemical Index.

PHP Script Revision 4.2

To MiRC Cleanroom  
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Center

To Georgia Tech

Please send questions and comments to the webmaster: [webmaster@grover.mirc.gatech.edu](mailto:webmaster@grover.mirc.gatech.edu)

Last modified on: Wednesday 17 November 2004 10:11 AM EST

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Ciba Specialty Chemicals  
Additives  
Imaging and Coating Additives

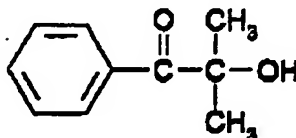
Ciba

## Ciba® DAROCUR® 1173 Photoinitiator

### General

DAROCUR 1173 is a versatile highly efficient liquid photoinitiator which is used to initiate the photopolymerisation of chemically unsaturated prepolymers - e.g. acrylates - in combination with mono- or multifunctional monomers.

### Chemical Structure

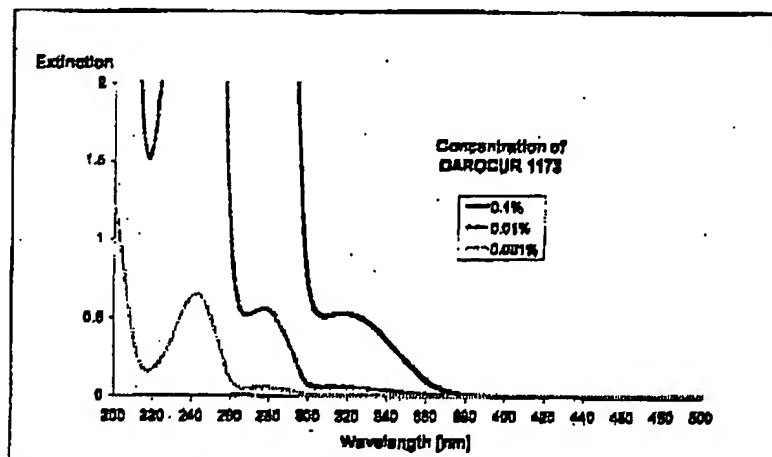


2-Hydroxy-2-methyl-1-phenyl-propan-1-one

Molecular weight: 184.2

CAS No. 7473-88-5

### Absorption Spectrum (% in Acetonitrile)



### Physical Properties

**Appearance:** colorless to slightly yellow liquid

**Odor:** slight

**Miscibility:** in most common organic solvents as well as most acrylate based monomers exceeds 50g/100g; practically insoluble in water.

**Melting point:** 4°C

**Boiling point (at 0.13 mbar - 0.1 Torr):** 80 - 81°C

**Flashpoint:** > 100°C

**Density:** 1.08 g/cm<sup>3</sup>

**Viscosity (at 20°C):** 25 mPa·s

### Application

DAROCUR 1173 may be used after adequate testing for applications such as UV curable clear coatings based on acrylates for paper, metal

**Ciba® DAROCUR® 1173**  
**Photoinitiator**  
**Ciba**

and plastic materials.

As a liquid UV curing agent with excellent compatibility, DAROCUR 1173 is especially easy to incorporate. It is therefore highly suitable for blends with other photoinitiators.

DAROCUR 1173 is especially recommended when UV coatings are required to exhibit only minimal yellowing even after prolonged exposure to sunlight. Yellowing of urethane acrylates may be further reduced by addition of Ciba Specialty Chemicals' hindered amine light stabilizer TINUVIN® 292.

The amount of DAROCUR 1173 required for optimum performance should be determined in trials covering a concentration range.

**Recommended concentrations :**

film thickness :	5 - 20 µm	2.0 - 4.0 % DAROCUR 1173
film thickness :	20 - 200 µm	1.0 - 3.0 % DAROCUR 1173

**Safety and Handling**

DAROCUR 1173 should be handled in accordance with good industrial practice. Detailed information is provided in the Safety Data Sheet.

**Trademark**

DAROCUR is a registered trademark.

**Important Notice**

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Ciba Specialty Chemicals  
Additives  
Imaging and Coating Additives

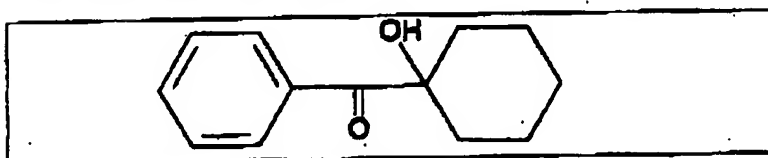
Ciba

## Ciba® IRGACURE® 184 Photoinitiator

### General

IRGACURE 184 is a highly efficient non-yellowing photoinitiator which is used to initiate the photopolymerisation of chemically unsaturated prepolymers - e.g. acrylates - in combination with mono- or multifunctional vinyl monomers.

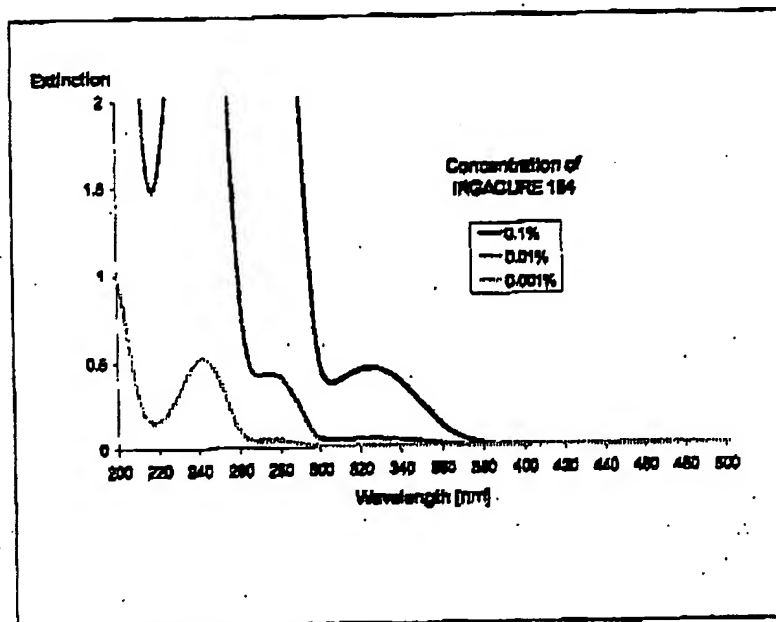
### Chemical Structure



1-Hydroxy-cyclohexyl-phenyl-ketone  
Molecular weight: 204.3

CAS No. 947-19-3

### Absorption Spectrum (% in Acetonitrile)



### Physical Properties (typical values)

Appearance: white to off-white crystalline powder

Melting point: 45-48°C

Solubility at 20°C (g/100 g solution):

acetone	> 50
butylacetate	> 50
methanol	> 50
toluene	> 50
hexanedioldiacrylate (HDDA)	> 50
oligomeric triacrylate	40
trimethylolpropanetriacrylate (TMPTA)	43
tripropylene glycoldiacrylate (TPGDA)	43

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**Ciba® IRGACURE® 184**  
**Photoinitiator**  
**Ciba****Application**

IRGACURE 184 may be used after adequate testing for applications such as UV curable clear coatings based on acrylates for paper, metal and plastic materials.

IRGACURE 184 is especially recommended when UV coatings are required to exhibit only minimal yellowing even after prolonged exposure to sunlight.

Yellowing of urethane acrylate systems for outdoor applications, directly exposed to sunlight may be further reduced by adding Ciba Specialty Chemicals' hindered amine light stabilizer TINUVIN® 292.

**Recommended concentrations**

film thickness	5 - 20 µm	2 - 4 % IRGACURE 184
film thickness	20 - 200 µm	1 - 3 % IRGACURE 184

**Safety and Handling**

IRGACURE 184 should be handled in accordance with good industrial practice. Detailed information is provided in the Safety Data Sheet.

**Trademark**

IRGACURE is a registered trademark.

**Important Notice**

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